CLINICAL COMPARISON OF CONVENTIOAL D. C. R. AND D. C. R. IMPLANT IN CHRONIC DACRYOCYSTITIS

THESIS

For

MASTER OF SURGERY

(OPHTHALMOLOGY)

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1992 **ANIL KUMAR RASTOGI**

C E R T I F I C A T E

This is to certify that the present work entitled "CLINICAL COMPARISON OF CONVENTIONAL D.C.R. AND D.C.R. IMPLANT IN CHRONIC DACRYOCYSTITIS", which is being submitted as a thesis for M.S.(Ophthalmology) was carried out by Dr. ANIL KUMAR RASTOGI himself, in the Department of Ophthalmology, M.L.B. Medical College, Jhansi (U.P.).

He has put in the necessary stay in the department as required by the regulations of Bundelkhand University.

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The techniques and methods described were performed by the candidate himself. The results and observations were checked and verified by me periodically.

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C O N T E N T S

INTRODUCTION

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Dacryocystitis is an inflammation of the lacrimal sac and may be acute or chronic, both types may be the sequel to obstruction of the nasolacrimal duct or in the sac itself.

Infection of the lacrimal sac is a common (either acute or chronic) disease which usually occurs in infants or in persons over 40 years, it is uncommon in the intermediate age groups.

Chronic dacryocystitis is the more common. It is most often unilateral, and is always secondary to obstruction of the nasolacrimal duct. In many adult cases the etiology of the obstruction remains unknown, but there may be a history of severe trauma to the nose. Acute cases are often preceded by chronic dacryocystitis, some cases are preceded by chronic conjunctivitis (e.g. Trachoma). The swelling sometimes increases to considerable size, becoming a large tumour of a curious bluish translucency over which the skin remains free, but at the same time the stoppage of the discharge tends to lessen the epiphora and the conjunctival irritation.

As for treatment of Dacryocystitis is concerned D.C.T. was the first operation in which inflamed disease sac was removed leading to constant watering, which was replaced by D.C.R. in which sac was connected with nasal mucosa. Although it is still are of the good method but lot of time and skill is required.

Recently Intracystic Implants has been tried with good results. It has advantage, firstly it can be done as an O.P.D. procedure, No other problem of bleeding or hospitalization is less.

Chronic dacryocystitis is commonly attributed to the effects of stricture of the nasal duct arising from chronic inflammation, usually of nasal origin. Obstruction to the lower end of the nasal duct may be caused by the pressure of nasal polypi, a hypertrophied inferior turbinate bone, extreme deviation of the septum.

Apart from this conventional method of D.C.R., a modified technique of D.C.R. has been developed.

D.C.R. is a time consuming process but as a modified technique polythene intubation was started by Summerhill. Intubation being a simpler process was tried in 100 cases of chronic dacryocystitis and patency of nasolacrimal duct was found in 93 cases. Silicone intubation is a safe and effective method for relief.

The purpose of intubation of either a part or the full length of the lacrimal passages by either flexible silicone or more rigid acrylic tube is -

(1) to overcome a stricture by prolonged constant dilatation and to encourage epithelial canalization at its site,

(2) to effect a fistulous track between the lacrimal sac and middle meatus of nose (Summerskill's intubation Dacryocystorhinostomy).

(3) to maintain the ostium in conjunctivorhinostomy where gross trauma has destroyed the lacrimal sac.

The failure of D.C.R. is rare occurring in most series in less than 15% cases. The management of unsuccessful D.C.R. poses a therapeutic problem. In failed cases when the site is explored one can observe the growth of granulation tissue in raw areas.

In some, the lumen of the tube becomes blocked by granulation, by polyps from the lacrimal sac and by progressive fibrosis.

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REVIEW OF LITERATURE

REVIEW OF LITERATURE

The dacryocystitis has been known from the earliest times owing to its grosser manifestations involving abscesses and fistulae on the face. In the middle of the first century A.D., however disease of the tear passages is mentioned in the literature. The gross pathological manifestations were shown to depend on inflammation not of the tissues generally but of the nasolacrimal canal, these manifestations taking three forms - acute, chronic and hydropsies or ulceration.

Incidence - Several features in the incidence of inflammation of the lacrimal sac are of importance.

Age - Apart from the special case of dacryocystitis in the new-born which depends upon development anomalies, the disease affects preferentially adults over middle life, being relatively rare in children and adolescents, the highest incidence is in the Vth decade, but it also occurs in advanced age.

The sex incidence is important, while the disease in the newborn affects both sexes equally, its occurrence among adults is in the ratio of 75 - 80% females to

25 - 30% males, a significant difference stressed by every authority. It is usually said that this very striking predilection for the female is due to a narrower lumen of the bony lacrimal canal (Meller, 1929; Ruiz Barranco and Martinez Roman, 1966 and others) which Heinonen (1920) associated with a high nasal index and although this explanation is not universally accepted, no other adequate reason has been advanced. The suggestions that women are more prone to the disease because they weep more often than men, or because they blow their noses less heartily, both of which tendencies might be construed to favour the stagnation of tears are hardly impressive.

Racial and geographical incidence appear to be of some significance. Thus the disease is rarer among Negroes than Whites, a circumstance which may be associated with sex incidence since radiological examination shows that in the former the canal is shorter, wider, less sinuous and is provided with a larger ostium (Santos-Fernandez, 1903-21). According to True (1900-26) disease is more common among Whites in tropical countries than in temperate climates.

Social incidence has been noted by most writers, a feature not seen in the congenital condition, for the majority of adult cases is found among those to whom cleanliness is not important.

A hereditary and familial tendency has been observed on many occasions since its annotation by Mackenzie (1840) in two sisters, it is usually transmitted as a dominant characteristics by both males and females to children of either sex but variations in the mode of transmission occur. As we shall see, the probable clue to the hereditary tendency is structural configuration.

There are probably many factors which tend to initiate or influence this process, to most of which has at one time or another been ascribed a primary role in the aetiology of the disease.

1. Anatomical factors - There is little doubt that structural constrictions of the lacrimal passages play a considerable part in the incidence of the disease. These may be associated with the mucosa, wherein a lack of complete canalisation particularly at the lower end of the canal is the cause of congenital dacryocystitis. Acting to a less degree the same process frequently leads to the formation of folds in the mucous membrane or results in a small ill functioning inferior opening, either of which tends to produce a condition of chronic stasis or even if any degree of tumescence is indeed, a complete obstruction (Scheeffer, 1920). It is probable that the somewhat rare cases of dacryocystitis occurring in children are due to this cause (Granstrom, 1938). The osseous canal also suffers considerable variations

and may be so narrow that, although the naso-lacrimal duct enclosed within may be permeable, the slightest intumescence would lead to occlusion.

The Sondermann's (1923) examination of 'normal' cadavers showed that marked constrictions by folds occurred in the lacrimal duct in 40% and moderate constrictions in 29% while only 31% had a normal lumen. Narrowing of the osseous canal has been found in cases of dacryocystitis and tends to occur with a flat nose and a narrow face (Meinoven, 1920; Seidemari, 1947), but is seen particularly if the lacrimal bone is undeveloped and the maxilla compensates for this deficiency (Whitnall, 1912). Moreover, the development of a spur on either the anterior or posterior lacrimal crest or the presence of a well-developed hamular process may constrict the entrance to the canal (Zabel, 1900; Onodi, 1913). These bony defects and deformities are frequently hereditary and account for some of the more marked cases of the familial transmission of the disease (Gueldi, 1930; Vogt, 1930).

2. Neighbouring Infections - There is little doubt that the spread of infection from neighbouring structures frequently determines the onset of inflammation, particularly in those cases wherein anatomical peculiarities predispose to stasis. Disease of the neighbouring bones and tissues may spread to the sac in a small number of cases wherein the aetiology is clear, it is more

controversial how frequent and important is the spread from the nose and sinuses on the one hand, and from the conjunctiva on the other.

Most discussion has arisen around the question of nasal disease since the source of infection was originally suggested by Planter (1724) and was stressed by Schirmer (1877) and Kuhnt (1891-95), it is known that inflammatory changes usually start and are more marked in the lower reaches of the lacrimal passage and it is probable that in a large number of cases their incidence is determined by the direct spread of infection from the nose. It seems equally probable, however that nasal disease is not the sole factor in the aetiology, but that it usually requires a favourable soil for its extension. It cannot by itself, for example, explain the social and sex incidence of dacryocystitis, nor can it be regarded as invariably present.

The incriminated lesions are numerous. Mechanical obstruction is frequently found, particularly an enlargement of flattening of the inferior turbinate which may almost obliterate the anterior part of the meatus and may cause a local rhinitis, implicating the opening of the duct (Harmer, 1915; Bilancioni, 1921; Sondermann, 1923; Post, 1928 and others). Similarly, a deflection of the septum may compress the inferior turbinate against the lateral nasal wall (Kofler, 1919-30; Stenger, 1920; Bockstein, 1926).

In this connection, it is interesting that suppurative dacryocystitis has followed packing of the nose (Ruttin, 1916; Kofler, 1919-30). Congestive and hypertrophic conditions of the mucosa, whether vasomotor or inflammatory, may similarly cause a varied degree of obstruction at the lower end of the canal, exceptionally a nasal polyp or a neoplasm acts in a similar manner.

Inflammatory conditions, whether chronic nasal catarrh or the more acute and suppurative infections, may spread into the lower part of the duct particularly if the ostium is freely open. Finally, atrophic conditions in the nose frequently figure in the aetiology, particularly ozoena, the destruction of the mucosa leaving a patulous ostium, not only permitting ready extension of the disease upwards but allowing the direct entrance of infective secretion into the duct on blowing the nose (Franceschetti, 1933). Heilmaier (1899), for example, found 136 cases of atrophic rhinitis among 352 cases of dacryocystitis.

Sinus disease has undoubtedly a close relation with lacrimation inflammation, here again some advocates of this particular source of infection has undoubtedly over stressed their case. Some authors admitted little or no relationship (West, 1926; Rockstein, 1926; Diggle, 1927 and others), while others claimed that sinusitis and dacryocystitis co-existed in too large a proportion of cases to be coincidental and that the latter frequently

cleared up on the relief of the nasal condition (Peters, 1905-13) 50% of cases of suppurative dacryocystitis with fistula, Khunt (1914) 68% of all cases of dacryocystitis with certain and 23% with probable sinus disease. Brumzlow (1920), 63.5% and 22%, Cordero (1934) 46% certain, 33% probable, Garfin (1942) 55%. It is probably that the infection spreads either by venous or lymphatic pathway, by continguity or by continuity, lacunae in the lacrimal bone sometimes allow direct continuity between the ethmoids and the sac, the wall of the lacrimal fossa and the upper part of the duct being pneumatised by ethmoid cells or the lacrimal bone, which is frequently paper thin, becoming absorbed by age, caries or pressure, while the pericystic tissues, rich in lymphocytes and heavily vascularized, form a readily traversible bridge between two.

Conjunctival infection constitutes a third method of direct spread, but all the evidence points to its rarity. Expecting infiltrating diseases, such as, trachoma, there is little evidence that infection from above figures largely in the aetiology of inflammation below the canaliculi.

3. General infections and general disease are occasionally responsible for the onset of dacryocystitis, as is indicated by the occurence of inflammation during the course of influenza, scarlet fever, diphtheria, chickenpox (Margaillan and Morenon, 1923; Mukherjee et al,

1969 and others). We shall see also that infections such as tuberculosis may become established through blood infection.

4. The factor of excessive lacrimation has at various times been given a place in the aetiology of dacryocystitis, an increased secretion of tears leading to stagnation with a tendency to atony of the sac, thus resulting eventually in chronic irritation, inflammation and a weakening of resistance to organismal attack.

5. As a rarity a dacryocystitis may be excited by a foreign body in the sac such as a cilium entering through the canaliculus (Mahr, 1894) or a body introduced through the nose (Malgat, 1890) but as a role in such cases the tolerance of the tissues in the more noteworthy feature.

A very rare clinical form is chronic peridacryocystitis, originally described by Cirincione (1890) and called pericystic tumour by Jocqs (1900) and pre-lacrimal tumour by Rollet (1900). Clinically it appears as a chronic abscess in the perilacrimal space leaving the lacrimal passages themselves patent (Wright, 1938). The infection may originate in the wall of the sac, or it may be formed in a diverticulum of the sac (Terson, 1903; Markomichelakis, 1964); alternatively, it may arise from a neighbouring periosteitis or sinusitis.

The diagnosis of chronic dacryocystitis usually depends on the symptoms of epiphora in the investigation of which an obstruction is found in the lacrimal passages and the fluid regurgitated into the conjunctival sac on syringing is seen to contain shreds of mucous or pus. In the more advanced cases the regurgitation of mucous or pus on pressure is diagnostic but in the latent forms, particularly when epiphora is not marked or has become un-noticed because of its long standing, it may be more easily missed, in these cases the pressure of unilateral chronic and intractable conjunctivitis should always arouse suspicion. In the absence of local inflamatory symptoms, however a simple stenosis can not be differentiated with certainly unless some discharge is seen or unless repeated conjunctival swabs, despite treatment reveal a constantly reinforced infection.

A mucocele is the commonest swelling at the site of the sac but may require to be differentiated from a tumour or a cold abscess, tuberculosis or syphilitis, by exploratory operation and biopsy; a radiological examination may help. Dermoid and sebaceous cysts are more superficial and leave the lacrimal passage patent. A mucocele of the paranasal sinuses is more common source of difficulty, particularly arising from an anterior ethmoid cell or the frontal sinus, but these usually present above the medial palpebral ligament. In these cases even in the presence of

persistent weeping, which may indeed by only the symptoms, the lacrimal passage remain permeable, while the diagnosis is made clear by the radiological and rhinological examination which should be undertaken in every cases of dacryocystitis and should always precede decisions as to treatment particularly when a driange operation is contemplated.

In acute dacryocystitis the differential diagnosis concerns chiefly inflamed sebaceous cyst or furuncles near the medial canthus, erysipeals of the face, an acute periostitis, an acute sinusitis or more rarely a dental abscess, particularly of the canine tooth, giving rise to a maxillary periostitis which may simulate a pericystitis. The most common source of confusion is an acute infection of the ethmoids or frontal sinus tracking to the lacrimal region, but in these cases the maximal swelling and pain are usually above the medial palpebral ligament pressure over the sac itself does not excite maximal tenderness and the lacrimal passages are permeable. In these cases the diagnosis can be confirmed by radiography of the skull and if necessary of the sac and clinical rhinological examination procedures which should always be done to determine not only the aetiology but also the extent of the disease.

The history of the treatment of dacryocystitis is interesting not only because of its antiquity and many expedients which have at various times been tried since

the era of the code of Hammurabi, but also because its exemplifies vividly the tendency for advances in knowledge to move in circles rather than in straight lines, there are few things under the sun which are really new. The story certainly serves to show how resourceful is the ingenuity of man and how great toleration of a sick body. Celsus (25 B.C. - A.D. 50) excised the disease tissue down to the bone which was then burned with a red-hot iron so that a large sequestrum fell away - a heroic extirpation of the sac combined with a nasal drainge operation. Archigenes (2nd century A.D.) with the same end in view, incised the sac, destroyed it with caustics and then bored several holes through the bone into the nose. These are similar somewhat brutual methods of approach held until Anel (1713) inaugurated the more conservative technique of attempting to restore the permeability of the passages themselves and establish drainage by systematic probing and syringing. These three principles - destruction of sac, drainage into the nose and restoration of the natural passages - have with many variations remained the basis of all subsequent attempts of treatment. Apart from these conservative treatment depends on heat and continuous firm pressure (Fabricius ab Aquapendente, 1613).

Other expedients were advocated. J.L.Petit (1734) incised the sac and from this vantage point forced probes through the duct, the wound being allowed to heal after

the duct had been kept continually open for sometime, a procedure reviewed by Golowin (1923) who forced sounds upto 9 mm in diameter through an incision in the sac down the duct, fracturing the bone on the way. On the other hand, de la Foreste (1753) practised retrograde probing from the nasal ostium, a method later advocated by Polyak (1902), Critchett (1864) and at a later date Brown (1928) used dilating sounds of laminaria; Weber (1863-65) advocated rapid dilatation with conical sounds upto 4 mm in diameter, a practice followed by Ziegler (1910-22). Attempts to secure permanent drainage by leaving a metal tube (of gold, Mackenzie, 1819; Dupuytren, 1833) or a style (or permanent probe) of silver in the duct (Walton, 1863) were persistently made, others used wires or tubes of gold, silver or lead and others again threads of silk catgut or silk worm gut.

All these procedures were revived in more recent years, particularly the permanent insertion of a polythene tube into the naso-lacrimal duct after exposing the lacrimal sac in cases of chronic dacryocystitis (Summerskill, 1952; Singh & Garg, 1972). Most of them, however, are applicable to stenosis of the duct than to the treatment of an inflammatory condition. Cures have been claimed with all these methods, but the risk of a spreading cellulitis would seem to render their general application dangerous. Several such accidents have occurred, some of them fatal owing to orbital cellulitis and meningitis (A.E. Jones, 1884;

Fulton, 1885; Leplat, 1894; Cabenues and Ulry, 1897; Hildneth, 1936).

The technique of dacryocystectomy is concerned the first essential is that the operation be carried out in a bloodless field with anatomical exactitude and the mucosa be removed in its entirely, particular attention being paid to the fundus of the sac and the junction with the canaliculi which, if necessary, can be completely dissected out around a probe in the canaliculus (Pooley, 1913) moreover, the duct must be destroyed by through curettage down the length of the naso-lacrimal canal. The survival of any mucosa will entail continued suppuration, a breakdown as a fistula, continued discharge through the puncta on pressure, and the persistence of annoying epiphora. It is to be noted that in such post-operative suppuration the abscess sometimes points above the medial palpebral ligament (West, 1932). It may happen that in the event of a canaliculosis persisting, the canaliculi may require to be destroyed by diathermy (Schultz, 1904).

During the end of the last century and indeed, during the first three decades of the present one, the classical methods of treating dacryocystitis were, therefore, probing by Bowman's technique in those cases wherein little structural damage had occurred, and excision of the sac in the vast majority of cases. In general, the results were satisfactory, but even when dacryocystectomy was most in

favour, the persistence of epiphora - even although not in distressing degree - always excited aspiration to return to the original technique of the ancients, wherein hope was offered of a total cure of the disease with a perfect restoration of function by re-establishing a connection between the sac and the nose (Caldwell, 1893, and others). How to make the communication permanent - essentially a rhinological problem remain unsolved until an Italian rhinologist.

Toti (1904) evolved his operation of external dacryocystorhinostomy. The operation was not immediately popular, partly because the technique was new and difficult to the ophthalmologist and partly because the results were not by any means invariably good. Subsequent improvements, however, have remedied these defects, but in the mean time a purely rhinological technique was proposed by West (1910) and Polyak (1912) - an endo-nasal or internal dacryocystorhinostomy wherein the approach to the sac was made from nose, a technique rendered more easy by a trans-septal approach (Kofler and Urbanek, 1925). These two techniques may be simplified to form a combined external inter-nasal operation (Mosher, 1915-23).

In the mean time, Forsmark (1911) in Sweden, elaborated the idea of transplantation of the sac wherein its lower part was cut away and implanted through a hole in the bone into the nose. Finally, owing to the persistence

of suppuration in some cases, Blaskovics (1912) partially excised and West (1921) completely excised the sac leaving at the same time an opening into the nose - partial or complete dacryocystectorhinostomy.

The original external dacryocystorhinostomy of Toti (1904) consisted of exposing the sac by an external incision, resecting its inner wall, punching out a corresponding piece of bone with a hammer and chisel, resecting a corresponding area of the nasal mucous membrane, and sewing up the external wound. The lateral wall of the sac, pressed by bandages over the opening in the bone, thus became the lateral wall of the nose into which the canaliculi opened directly so that the sac itself as such ceased to exist. The success of the operation depended largely on the extensiveness of the resection, but even so, the formation of granulations or the presence of extensive disease of the walls of the sac frequently resulted in failure from subsequent cicatrization.

Dupuy-Duttemps's technique or modification of it has remained the most popular, and in suitable cases a very high percentage of functionally good results can be obtained 95% in 1000 cases.

The modification have been variations in the methods of suturing, thus Soria (1944) sutured a single flap of nasal mucosa to the posterior flap of the sac and

the anterior flap to the bony wall of the nose for the hammer and chisel of Toti. Iliff (1954) introduced the oscillating stryker trepain saw, and Krasnov (1971) cut the bone ultrasonically. Several surgeons have attempted to maintain patency in the opening by the temporary introduction of such agents as rubber catheters, polythene tubes, gauze or silk sutures. Good haemostasis is essential indeed to attain it some surgeons relied or hypotensive anaesthesia (Rycroft, 1959). The opening in the bony lacrimal fossa should be large, at least 12.0 mm in diameter and should exclude the medial wall of the naso-lacrimal canal. Mucosa should be sutured to mucosa anteriorly and posteriorly, and the medial palpebral ligament is best preserved.

Partial or complete dacryocystorhinostomy is applicable when the walls of the sac are extensively diseased and their retention seems inadvisable, a technique available when the sac is absent. To meet such cases, Blaskovics (1912), Hotte (1918) and Arruga (1935-38), using an external method, removed the whole sac except that part into which the canaliculi open and thereafter made an opening into the nose.

The various technical modifications introduced into these procedure have been ably reviewed by Chandler (1936), Welt (1950) and Pico (1972).

Galen in the second century also employed to surgery to create a new passage way from the lacrimal sac to nose.

Modern surgery of the lacrimal sac began in Italy in 1904, with Toti's description of an operation which involved

(1) creation of an opening into the nasal wall with hammer and chisel,

(2) removal of the nasal mucosa in this opening and the medial half of the lacrimal sac. Sutures were used only in the skin. Toti was successful in about half of his cases. Blascovics in 1912 used the Toti's technique but removed the entire lacrimal sac except for a small portion surrounding the opening of the canaliculi.

The basic technique of DCR was modified as follows -

In 1920, and again in 1922, Dupuy-Duterns and Bouvgnet in France and Ohms, working independently in Germany, modified the Toti technique by dissecting the anterior and posterior flaps of the nasal and lacrimal mucosa and then suturing the flaps together. The French surgeon had successful results in 94% of more than 1000 operations.

In 1921, Mosher combined the Toti's technique with intranasal removal of the middle turbinate and suture of the anterior border of the opening in the lacrimal sac to the tissues anterior to the bony opening. He anticipated success in 90% of all cases.

In 1947, Hogan reported such results in 49 operations performed by a modification of the Mosher-Toti technique.

In 1911, Forsmark recommended transplantation of the lacrimal sac. The same recommendation was made by Stock in 1934, and by Gifford in 1944. In this technique the sac is severed from the naso-lacrimal duct at its junction with it, after which its lower end is pulled into the bony opening by sutures brought out through the nosal.

In 1944, Soria recommended suturing a single flap of nasal mucosa to the posterior flap of the lacrimal sac. He also recommended suturing the anterior flap of the sac of the anterior border of the bony opening. Gauze drainage from the sac down to the nasal fossa was provided for 72 hours.

In 1946, Arruga brought together his experiences with dacryocystorhinostomy, which covered many years and which has previously been reported in a number of publications. His operations were performed by the Dupuy

Dutemps technique and were facilitated by several new instruments of his own design.

In 1954, Iliff suggested that the stryker saw can be used to open the lateral bony nasal wall. The rapid oscillating action of the saw is far less traumatic than the action of dental, or other burs, bone chisels and rongeures.

In what has been said so far in this brief historical note, one must be impressed by many efforts made to modify the Dupuy-Dutemps technique. The reason, it seems, is that this is a difficult operation, particularly in respect to the accurate approximation of the corresponding flaps of the nasal mucosa and lacrimal sac by direct sutures. Another reason for failure in a certain number of cases is post-operative closure of the newly created lacrimal tract either by formation of granulation tissue at the new bony opening, of the anterior flaps to the posterior flaps. Arriaga puts particular stress on this latter possibility. To simplify the operation, several observers recommend that no sutures be used to unite the flaps but instead, plugging agents should be left between them. Other surgeons use the basic Dupuy-Dutemps technique or some modification thereof and suture the flaps, but also leave some sort of plugging agents between (rubber catheters, steel wire, silicone sponge, polythene tubes, sicks of suture material & gauze).

The flaps are sutured as recommended by Soria. The bony opening is created by the Illiff trephine on the stryker saw. A 2.0 or 4.0 silk suture is left in the new lacrimal drainage pathway for several days, as recommended by Castrovicio. This technique was found simple, safe, efficient and uncomplicated.

If a chronic dacryocystitis should be corrected before intraocular surgery, Dacryocystorhinostomy is the preferred operation.

Dacryocystorhinostomy is indicated for the relief of disabling epiphora due to physiologic insufficiency of the lacrimal pump or to atonic distension of the lacrimal sac.

Useful as Dacryocystorhinostomy is, dacryocystectomy is still indicated in three diseases of the lacrimal sac - (1) Malignant lesion, (2) Tuberculosis, and (3) Syphilis. This operation was formerly the favoured procedure for all conditions of the lacrimal sac, but now it has been almost entirely replaced by external dacryocystorhinostomy.

Dacryocystorhinostomy is also indicated for the relief of disabling epiphora due to physiologic insufficiency of the lacrimal pump or to atonic distension of the lacrimal sac.

The surgeons who undertakes any operation on the lacrimal sac must possess a precise knowledge of the

anatomy of the lacrimal excretory pathways and of their relations to other structures and landmarks. Bleeding will be excessive and dangerous for instance, unless the surgeons bears in mind the position of the angular blood vessels, which are situated slightly anterior to the lacrimal crest.

Pre-operative dacryocystography may give valuable information. Two other precautions are important. Patency of the lower punctum the common punctum and canaliculus must be assured.

Dacryocystorhinostomy with silicone sponge (Thomas, J. Mirabile, M. D., and Charles Tucker, M.D., East Hartford, Conn. 1965) :-

Dacryocystorhinostomy fail in a large percentage of cases because of obstruction of the newly made canal by granulation tissue and scar contracture. A tapered silicone sponge implant has been used in 12 successive operations for chronic dacryocystitis without failure.

The purpose of this communication is to demonstrate the use of this material. The operative technique was a modification of the Dupuy-Dutemps procedure. All operations were performed under local anaesthesia.

All these procedures were reviewed in more recent years, particularly the permanent insertion of a polythene tube into the naso-lacrimal duct after exposing the lacrimal sac in cases of chronic dacryocystitis (D.C.R. - a modified technique by A.M. Joglekar, July 1983).

Dacryocystorhinostomy by routine method gives definitely few failures in the best hands where all technical details are observed like proper size of bony window (12.5 mm x 10 mm), proper suturing and proper size of flaps. The average rate of success is about 90%, ranging from 80% to 95.7%.

In failed cases, when the site is explored, one can observe growth of granulation tissue is raw areas. In routine method, only two areas of the stoma are covered by mucosa and superior and inferior area are left raw.

Follow-up ranges from 6 months to two years. Total 86 cases were operated. Four cases had recurrence of symptoms (95.34%) success.

Dr. A.M. Joglekar (1983) experience chances of blocking of stoma with granulation tissue is reduced with D.C.R. with implant.

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MATERIAL AND METHODS

MATERIAL AND METHODS

Patients with complain of watering and pus discharge and diagnosed as chronic Dacryocystitis were admitted in M.L.B. Medical College Hospital and were investigated under the following headings.

Clinical evaluation :

History :- In every case, detailed history of symptoms, duration and associated diseases of nose (just like DNS) and sinuses were taken.

Local examination :

Lacrimal excretory system, nose and sinuses in particular details were conducted. In all cases we examined the following points -

Examination of eye lids -

i) Inversion,
ii) Eversion,
iii) Lid laxity.

Lacrimal sac - External examination of sac -

a) Position of puncta
- Upper,
- Lower

b) Any discharge.

c) Swelling.

d) Fistula.

e) Skin colour.

Syringing of lacrimal sac for patency -

a) Lower puncta.

b) Upper puncta.

Regurgitation of saline -

a) Same puncta.

b) Upper puncta.

X-ray PNS (as and where needed).

Schirmer test (as and where needed).

Dacryocystogram (D.C.G.) (as and where needed).

General Examination -

i) CVS

ii) Respiratory system.

Investigation - Blood - BT, CT, Hb%, TLC, DLC.

Blood sugar - Fasting,

- P.P.

Urine - Albumin,

- Sugar.

Past History - (i) History of Hypertension,

(ii) History of Diabetes,

(iii) History of Bleeding tendency.

After seeing all the investigations and fitness of patients, patient is operated either by conventional D.C.R. method or D.C.R. Implants.

Operative Steps :

Anaesthesia - D.C.R. operation can be done under general anaesthesia and also local anaesthesia.

A cotton gauze well dipped with xylocaine and adrenaline is introduced into nose by nasal speculum. In such a way so that it may contact with the area of nasal mucosa which corresponds to the lacrimal fossa. The shrinkage and ischamia which follow this application, inhibit bleeding when mucosa is incised. The gauze piece is removed at appropriate stage of the DCR operation.

Local anaesthesia is achieved by subcutaneously injecting 2% xylocaine with adrenaline just medial to the medial canthus over the nose. 1 ml of xylocaine with adrenaline is injected in superior orbital notch region.

Dacryocystorhinostomy -

1. A straight incision is made 8 mm medial to the inner canthus.

2. The anterior lacrimal crest is exposed and the superficial portion of the medial palpebral ligament is divided.

3. The periosteum is divided from the spine on the anterior lacrimal crest to the fundus of the sac and reflected forwards. The sac is reflected laterally from the lacrimal fossa.

4. The anterior lacrimal crest and the bone from the lacrimal fossa are removed.

5. A probe is introduced into the lacrimal sac through the lower canaliculus and the sac is incised vertically to create two flaps.

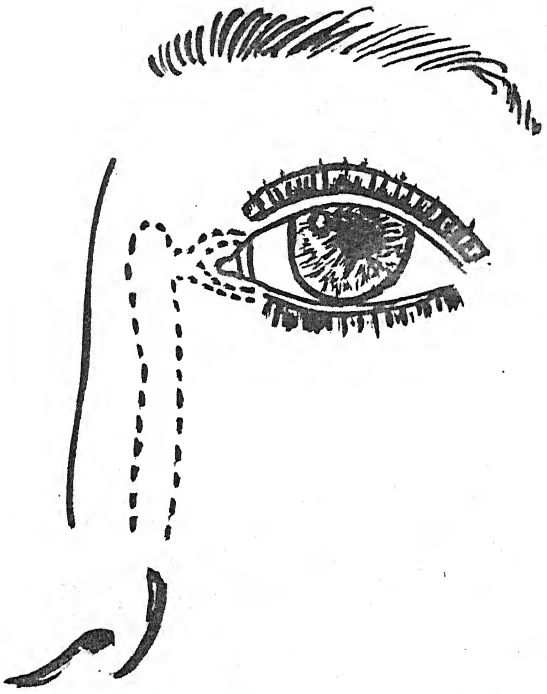
6. A vertical incision is made in the nasal mucosa to create anterior and posterior flaps.

7. The posterior flaps are sutured with 6.0 catgut sutures.

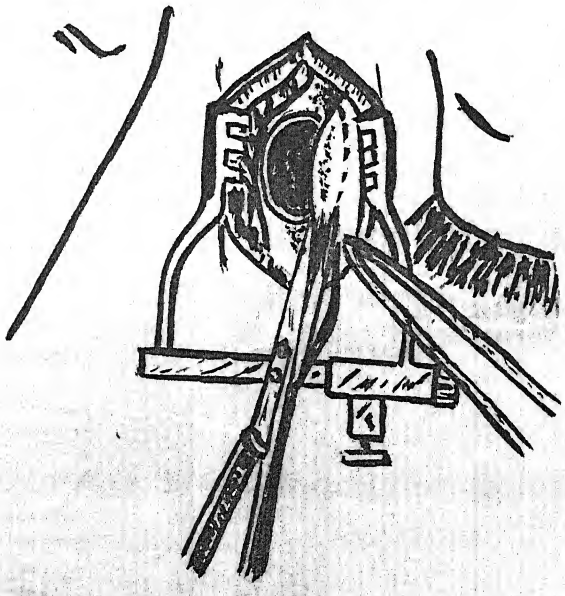
8. The anterior flaps are sutured.

9. The two heads of the orbiculosis muscle are opposed with 6.0 catgut and the skin incision is closed with interupted 6.0 silk suture.

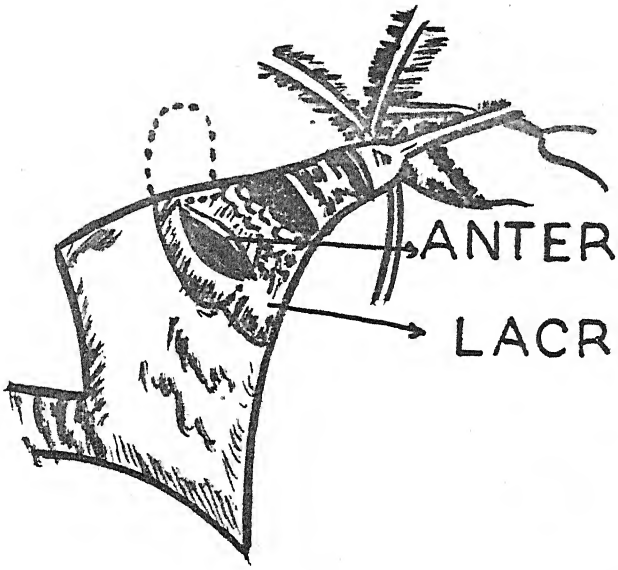
Conventional D.C.R. method is adopted upto the step of opening of lacrimal sac. After the exposure of lacrimal sac it is retracted laterally to expose lower part of lacrimal fossa. An ostium is created with the



OUT LINE OF LACRIMAL APPRATUS



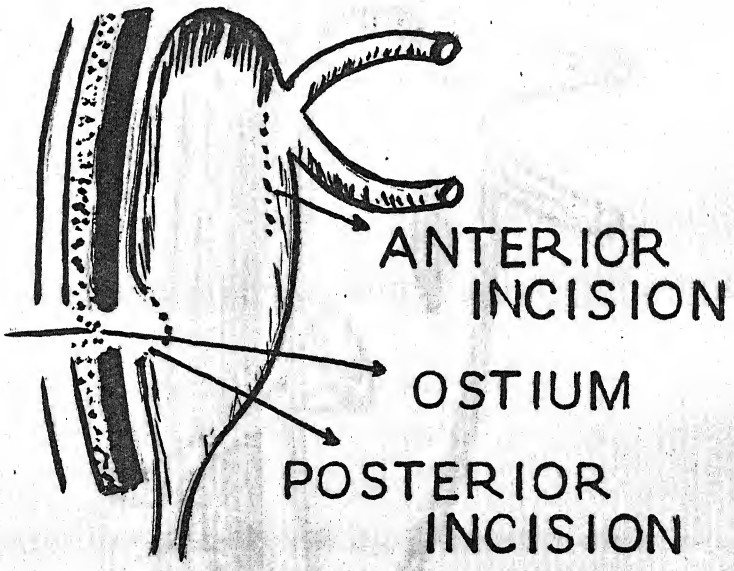
EXPOSURE OF LACRIMAL SAC



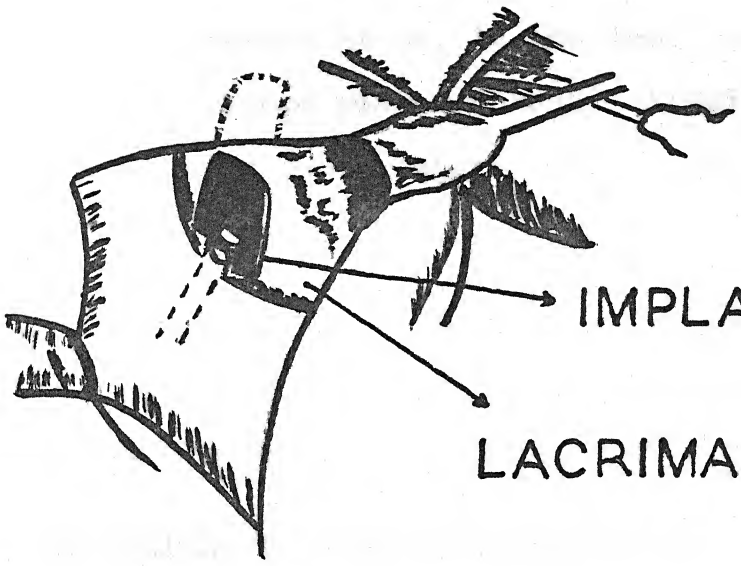
INCISIONS IN THE LACRIMAL SAC

INTRODUCER

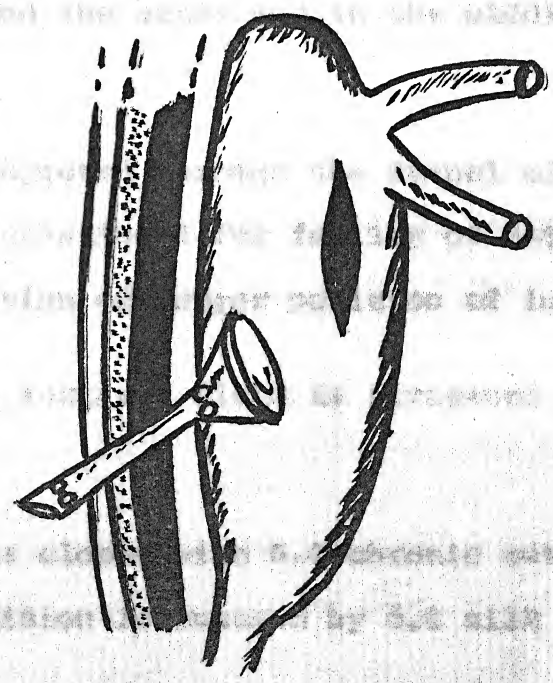
INTRODUCER LOADED WITH IMPLANT



ANTERIOR AND POSTERIOR INCISIONS IN SAC WALLS



POSITION OF IMPLANT
AFTER INSERTION



FINAL POSITION OF IMPLANT
IN TO SAC

help of JENKIN's type mastoid gauge, in the lower part of lacrimal fossa. The gauge passes through lacrimal bone and nasal mucosa. The gauge points towards posterior, medial and lower directions.

A vertical incision around 3 mm long is made through the 2 mm incision is made in the postero-medial wall of the sacs just opposite the ostium.

Then a sterilised implant is loaded on the introducer and introduced through anterior opening of the lacrimal sac into the nasal cavity. It is placed in such a way that it points towards posterior, medial and lower directions similar to the direction of mastoid gauge. The wider portion (collar) of the implant lies in the cavity of the sac and the other end in the middle meatus of the nose.

Saline is injected through the funnel of implant and the patient is questioned for feeling of matter in the throat for confirmation of proper position of implant

The sac and surgical field is irrigated with normal saline.

The wound is closed with 6.0 chronic catgut in layers and skin incision is sutured by 6.0 silk suture.

Syringing is performed immediately after closure of wound. A light dressing is done with Neosporin eye ointment on wound.

After D.C.R. with implant post-operatively prescribe -

1) Orally allowed after 2-3 hrs of operation.

2) Oral antibiotics,

3) Oral analgesics and anti-inflammatory drugs x 5 days,

4) Cap. Becosule x 5 days.

Daily locally apply Neosporin eye ointment on the wound and eye and next day syringing is done.

Patient get discharged after 5-6 days of operation. Syringing is done daily and repeated once a week for 4-5 weeks.

AIMS OF STUDY :

1. As D.C.R. by conventional method gives failure, to see results with nasal intubation, whether they are better or not.

2. To see the mobility of patients to compare with conventional D.C.R.

3. Cosmetic usefulness of nasal implants.

4. Role of nasal implant method in cases where D.C.T. has already been done.

5. Usefulness of implants in deformed nasal bridge and senile atrophic mucosa.

6. Usefulness of implants in infancy.

7. Save valuable time of surgeons.

8. Less bleeding than conventional D.C.R.

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OBSERVATIONS

OBSERVATIONS

In our present study, 100 cases of chronic dacryocystitis were operated, out of which 80 cases were followed-up for a period of 3-6 months. In our study we used "Pawar implant".

Group A :

Twenty cases of chronic dacryocystitis were operated by conventional method of dacryocystorhinostomy. It is sub-divided into 2 sub-groups as follows :-

Sub-group (i) consists of 2 patients having bilateral chronic dacryocystitis.

Sub-group (ii) consists of 18 patients having unilateral chronic dacryocystitis.

Group B :

It consists of 60 cases of chronic dacryocystitis where D.C.R. implant operation were performed. It is sub-divided into 3 sub-groups as follows :-

Sub-group (i) - consists of 5 cases of chronic dacryocystitis having bilateral involvement.

Sub-group (ii) - consists of 45 cases of chronic dacryocystitis where unilateral involvement occurred.

Sub-group (iii) - consists of 10 cases where already D.C.T. was done.

Clinical Particulars :

Age & Sex :- In our study of 80 cases, females were affected more commonly (71.25%) than males (28.75%). The sex ratio is shown in Table - I.

Age :

Age distribution in our series of studies of cases varies from 11-60 years. Maximum cases were found in age group of 21-40 years, both for males as well as females. The age incidence in both sexes is shown in Table - I.

Table - I

Age and sex of cases.

Sl. No.	Age group in years	No.of cases	Male	Female
1.	11 - 20	20	5	15
2.	21 - 30	30	10	20
3.	31 - 40	20	5	15
4.	41 - 50	6	2	4
5.	51 - 60	4	1	3
	Total	80	23 (28.75%)	57(71.25%)

Side involvement :

Left side was more commonly involved than the right side as shown in Table - II.

Table - II

Showing side involvement of eye.

Sl. No.	Type of operation	Total No.of cases	Involvement of Rt.eye	Lt.eye	Both eyes
1.	Cases in which D.C.R. operation was done	20	6	12	2
2.	Cases where D.C.R. implant was performed	50	18	27	5
3.	Cases where D.C.R. implant was performed after D.C.T. operation	10	3	5	2
	Total	80	27	44	9
	Percentage		33.75	55.0	11.25

Right eye involvement was seen in 33.75% only. Left eye involvement was seen in 55%. both eye involvement was seen in 11.25%.

Presenting Symptoms :-

Presenting symptoms in chronic dacryocystitis varied from watering of eyes to fistula formation. The most common symptoms were mucopurulent discharge and watering from eyes which were present in 70 cases (87.5%) as shown in Table - III.

Table - III

Showing presenting symptoms in 80 cases.

Sl. No.	Presenting symptoms	No. of patients	Percentage
1.	Watering	50	62.50
2.	Mucopurulent discharge	15	18.75
3.	Mucopurulent discharge + watering	5	6.25
4.	Watering + swelling in sac area	3	3.75
5.	Mucopurulent discharge + swelling over sac	5	6.25
6.	Mucopurulent discharge + Fistula in sac area	2	2.50
	Total	80	100.00

Associated Diseases :

Almost all the cases of epiphora showed associated diseases. Deviated nasal septum (15%), Trachoma (75%) and hypertrophied nasal mucosa (80%), Maxillary sinusitis (40%) and conjunctivitis (65%) were associated with chronic dacryocystitis.

Table - IV

Showing associated diseases.

Sl. No.	Associated diseases	Percentage
1.	Deviated nasal septum	15%
2.	Trachoma	75%
3.	Hypertrophied nasal mucosa	80%
4.	Maxillary sinusitis	40%
5.	Conjunctivitis	65%

Bleeding occurred during Operation :

In conventional D.C.R. :- Operative bleeding was mostly seen in cases of conventional D.C.R. operation.

D.C.R. with implants :- Bleeding during operation was reported in 2 cases out of 50 cases and D.C.R. implant where D.C.T. was already done was reported in 2 cases out of 10 cases as shown in Table - V.

Table - V

Incidence showing bleeding during operation.

Sl. No.	Type of operation	Total No.of cases	No. of cases where bleeding occurred during operation	%
1.	Conventional D.C.R. method	20	10	50%
2.	D.C.R. implant method	50	2	4%
3.	D.C.R. implant after D.C.T. operation	10	2	20%
	Total	80	14	

There was no incidence of post-operative abscess formation / or granulation seen in our series.

Incidence of obstruction of bony opening :

In our study due to obstruction of bony opening drainage occluded in three (3) cases in conventional D.C.R. method, in which deviated nasal septum was associated. No such occlusion of drainage was reported in D.C.R. implant method, but 2 cases were reported in cases where D.C.T. was already done, as shown in Table VI.

Table - VI

Incidence of obstruction of bony opening.

Sl. No.	Type of operation	Total No. of cases	No. of cases where occlusion occurred
1.	Conventional D.C.R. method	20	3
2.	D.C.R. with implant	50	-
3.	D.C.R. implant where D.C.T. done	10	2
	Total	80	5

Incidence of Expulsion of Nasal implant :

In D.C.R. implant, 60 cases were performed and out of these cases, not a single case of implant expulsion seen.

Patency of Naso-lacrimal duct :

In 67 cases the duct was patent from first post-operatively syringing and remained patent throughout the follow-up period, while in 8 cases the tube was partially patent, whereas in 5 cases, it was completely blocked.

Table - VII

Patency of Naso-lacrimal duct.

Sl. No.	Type of operation performed	Total No.of cases	No.of cases where patency of Naso-lacrimal duct was observed		
			Complete patency	Partial patency	Failure to estb-lish patency
1.	Conventional D.C.R.	20	15 (75%)	3 (15%)	2 (10%)
2.	D.C.R. implant	50	45 (90%)	3 (6%)	2 (4%)
3.	D.C.R.implant where D.C.T. was already done	10	7 (70%)	2 (20%)	1 (10%)
	Total	80	67	8	5

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DISCUSSION

DISCUSSION

One hundred cases of chronic dacryocystitis were operated, out of which 80 cases were followed-up for a period of 3-6 months.

Out of 80 cases, 20 cases were operated by conventional method of D.C.R. and rest 60 cases by D.C.R. implant & D.C.T. with implant.

In Conventional Method of D.C.R. :

Complete patency was observed in 15 cases (75%) and partial patency in 3 cases (15%), and 2 cases (10%) were labelled complete failure.

In D.C.R. Implant :

Out of 80 cases of chronic dacryocystitis, 50 cases were operated by D.C.R. with Implant method, of which 45 cases (90%) were having complete patency in post-operative follow-up, 3 cases (6%) as partially patent and 2 cases (4%) were found complete failure.

In D.C.R. Implant where D.C.T. was already done :

Out of 80 cases of chronic dacryocystitis, 10 cases were operated by D.C.R. implant where D.C.T. was

already done. In these cases, 7 cases (70%) were having complete patency, in 2 cases (20%) as partial patency and in 1 case (10%) was found complete failure.

We have analysed these cases and tried to find out the possible causes of failure and other post-operative problems under following headings.

Age and Sex :

In our study we found 20 cases in age group of 11-20 years, 30 cases in 21-30 years, 20 cases in 31-40 years, 6 cases in 41-50 years and only 4 cases in 51-60 years of age as shown in Table No. I.

The peak incidence of the disease in female occurred in 21-30 years of age. This difference was due to the fact that specific infections are common in males while females are suffered from chronic irritation due to smoke and their daily household activities.

In our study highest incidence of dacryocystitis was found in the age group of 21-30 years. But according to "Duke Elder" (1961) highest incidence of dacryocystitis was reported in the age group of 15-20 years. Besides dacryocystitis in the newborn, the disease affects preferentially adults over middle life and can occur in advanced stage.

S.R.K. Malik (1969) found that average age in females was 35 years and in males it was 23 years. The highest incidence in females was in age group of 30-40 years, whereas, in males it was in late twenties.

Duke Elder's (1961) ratio of males and females was 1 : 3, however, in our study, male & female ratio observed in 1 : 2 (male patients were 23 cases (28.75%) and female petients were 57 cases (71.25%).

It is usually said, this very preponderence for the female is due to a narrower lumen of the bony lacrimal canal (Meller, 1929; ruiz Banuncs and Martinez Roman, 1966 and others).

Saha et al (1967) also found that the incidence of lacrimal passage pathology was more in females. Malhotra et al (1984) also observed that females were more affected than males.

<u>Side Involvement of Eyes</u> :

In our study of 80 cases of chronic dacryocystitis 71 cases (88.75%) had unilateral involvement, whereas 9 cases (11.25%) had bilateral involvement of the eyes. The left eye was more frequently involved in 44 cases (55%) than the right eye (27 cases, 33.75%) as shown in table No. II. Malik et al (1969) and later on Mukherjee, P.K. and Jain, P.C. (1972) also reported that left side

was more commonly involved than right side. There is no explanation for the kind of behaviour.

Presenting symptoms :

In this study of 80 cases of chronic dacryocystitis, the symptom of inflammation of lacrimal sac and duct presented many variations, as shown in table III. We found that in 50 cases there was watering only, in 15 cases mucopurulent discharge and in 5 cases mucopurulent discharge with watering was the chief complaints. But in 9 cases mucopurulent discharge was associated with swelling over sac. In 3 cases swelling was associated in surrounding region also. In two cases mucopurulent discharge was associated with fistula.

The most common symptoms was mucopurulent discharge with watering which were present in 87.5% cases.

Associated Diseases :

Correlation of chronic dacryocystitis with associated diseases is shown in table IV. There is little doubt that the spread of infection from the neighbouring structure frequently determines the onset of inflammation, diseases of neighbouring bones and tissues, which may spread to sac. In our study 15% cases were found having deviated nasal septum and highest incidence was of hypertrophied nasal mucosa (80%).

Similarly, sinus diseases has a close relation with lacrimal inflammation. In our study 40% of cases reported were affected by maxillary sinusitis. It is probable that the infection spreads either by lymphatic pathway or other sources.

Conjunctival infection spreads directly but all the evidence points go to its rarity. In our study 62% cases were reported having conjunctivitis. But the infilterating diseases such as trachoma also causes infections. General infections and general diseases are occasionally responsible for the onset of chronic dacryocystitis, as is indicated in influenza, scarlet fever, diphtheria, chickenpox or smallpox (Magaillan and Narenon, 1923; Mukherjee et al, 1969).

Bleeding occurred during operation :

Bleeding during operation was more in cases where D.C.R. operation by conventional method was done as shown in Table V. We operated 20 cases by conventional D.C.R. method and out of 20, in 10 cases (50%) bleeding occurred during operation. Because due to the bony opening and sometimes destruction of nasal mucosa chances of bleeding is more. As compared to D.C.R. with implant where only 2 (4%) cases had bleeding (mild) and D.C.R. with implant 10 cases after D.C.T. operation was already done. Out of 10 cases, in 2 cases (20%) bleeding occurred during operation.

There was no incidence of post-operative abscess formation / or granulation seen in our series.

Incidence of obstruction of bony opening :

In our study due to obstruction of bony opening drainage occluded in three cases in conventional D.C.R. method, in which deviated nasal septum was associated. No such occlusion of drainage was reported in D.C.R. implant method, but 2 cases were reported in cases where D.C.T. was already done, as shown in Table VI.

Incidence of Expulsion of Nasal Implant :

In D.C.R. with implant, 60 cases was performed and out of these cases not a single case of implant expulsion.

Patency of Naso-lacrimal duct :

Patency of duct was seen in 67 cases of total cases as shown in table VII. High patency was seen in D.C.R. implant 45 cases (90%). Patency with conventional D.C.R. was seen in 15 cases (75%). In three cases, partial patency was seen in conventional D.C.R. method (15%) and with D.C.R. implant in 3 cases (6%). Patency with D.C.T. with implant was seen in 7 cases (70%) and partial patency in 2 cases (20%). The failure patency

was seen in total 5 cases out of which 2 cases (10%) were noted in conventional D.C.R. and 2 cases in (4%) D.C.R. implant and one case (10%) was seen where D.C.T. has already been done as shown in table VII.

Bowman (1957) used probing usually fails in establishing patency. Summerskill (1952) used polythene intubation in 80 cases but results of patency were 80%. Singh & Garg (1972) and later on Mukherjee in 1972 tried polythene intubation in 44 cases but success rate was 40%. The success rate of D.C.R. was 80 - 90% (Stallard, 1973) while 8% suffers from recurrence.

The idea of keeping the naso-lacrimal duct patent with a tube is not new. Valesstin-Gamazo (1957) reported 15 cases but there was 1 failure. Dejan (1955) achieved uniformly good results. Le-Grand (1957) reported 16 cases but got 100% failure.

Jogelkar (1978) observed 95.34% success rate by D.C.R. method. Pradeep. B. and Rajendra Babu (1983) observed complete patency in 17 cases while 2 cases were having partial patency and one case as failure. Maria, D.L. & V.S.K. Balburkar (1983) observed 78% success rate, partial patency in 12% cases and failure in 10% cases. Guillermo-Pico (1971) performed 121 operation by D.C.R. method and there were only 4 failures.

Pawar and Patail (1987) from Nagpur Medical College, used Pawar Implants with a success rate of 95%.

In our study, out of 60 cases of D.C.R. with Implant, used Pawar Implants and achieved a success rate of 57 cases (95%).

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CONCLUSION

CONCLUSION

The present study "Clinical comparison of Conventional D.C.R. and D.C.R. Implant in chronic Dacryocystitis", was carried out in the Department of Ophthalmology, M.L.B. Medical College, Jhansi. In this study 100 cases were operated, out of which 80 cases were followed-up for a period of 3-6 months. Twenty cases were operated by conventional D.C.R. method and 60 cases were operated by D.C.R. implant method. On behalf of our present study, we make up following conclusions :

1. Chronic dacryocystitis is the disease which is more common in young adults ranging between 21 - 40 years.

2. The left side (55%) involvement is more than the right eye (33.75%).

3. Most common site of obstruction was found at the junction of lacrimal sac and naso-lacrimal duct.

4. Females are commonly affected probably due to long and narrower lumen of the bony lacrimal canal.

5. Disease of conjunctival sac, nose and para-nasal sinuses also contribute in the obstruction of naso-lacrimal passage.

6. The mobility of patients was observed earlier where D.C.R. implant method was adopted than the conventional D.C.R. method.

7. Bleeding occurred during operation was much more in conventional D.C.R. (50%) method than D.C.R. implant method (4%).

8. Conventional D.C.R. method is a time consuming process than D.C.R. implant method.

9. D.C.R. implant method can also be adopted wherein patients D.C.T. was already done.

10. D.C.R. implants are very useful cosmetically than conventional D.C.R. method.

11. The patency of naso-lacrimal duct was observed. Much better results are seen in D.C.R. implant method than conventional D.C.R. method.

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APPENDIX

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Department of Ophthalmology,
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PROFORMA FOR EXAMINATION

Case No. _____ Date : _____

1. Name of Investigator :
2. Surgeon I/C. :
3. Place :

DETAILS OF PATIENT :

1. Name :
2. Age / Sex :
3. O.P.D./M.R.D. No. :
4. Occupation :
5. Address :
6. Socio-economic status:

A. Presenting symptoms :

1. 2.
3. 4.

B. Brief history of present illness :

C. Past history :

- Tuberculosis
- Diabetes
- Any other

D. Family history :

H/o active tuberculosis in any family members of known case of tuberculosis of neighbours :

E. Personal history :

F. Examination :

(a) General Examination -

- General appearance
- Vitals
- Cyanosis
- Oedema
- Lymphadenopathy : - Cervical
  - Axillary
  - Inguiral
  - Other

(b) Systemic Examination -

- Respiratory
- C.V.S.
- C.N.S.
- Abdomen

(c) Local Examination -

- Head
- Face : Symmetry

RE LE

- Orbit
- Eye brows
- Eye lashes
- Eye lids
- Conjunctive (Kiaberative)
  - Bulbar

- Anterior chamber -

  • Depth
  • Contents

- Iris -

  • Colour
  • Surface
  • Patterns
  • Others

- Pupil -

  • Lens
  • Visual acuity
  • Tension - digitally

E.N.T. check-up - for any Nasal Pathology :

INVESTIGATIONS :

Blood - T.L.C.
- D.L.C.
- Hb%
- E.S.R.
- B.T.
- C.T.

Urine - Albumin
- Sugar
- Microscopic

Stool - for any ova/cyst of hilmenthic group.

Any other -

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